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ABSTRACT

The capability to predict human resource requirements based on the introduction of new technology has long been a research objective within psychology. The purpose of this study was to develop a procedure for quantifying the effects of incoming technology. A five-step approach was taken and included critical analysis of the recent literature to review the status of forecasting and assessing technology, and of techniques for predicting the impact of technology on human resources; development of Design Option Decision Trees (DODT) describing two Air Force Systems; synthesis of existing techniques to develop a procedure for measuring the effects of technology on human resources; application of the procedure; and evaluation of the feasibility of the evolved procedure. A procedure integrating the DODT with a modification of the methods of summated ratings was developed to permit quantification of human resource components at design options within the DODT. Using judgmental data collected from an Air Force operational unit, the method developed was evaluated. It was concluded that quantifying human resource components associated with hardware design options by means of a technique incorporating a DODT and a modification of the method of summated ratings was feasible and could provide a usable methodological approach. (Author)

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QUANTIFICATION OF THE IMPACT OF TECHNOLOGICAL CHANGES ON HUMAN RESOURCES†

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Presented at

The 21st Annual Meeting of the
Southeastern Psychological Association

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INTRODUCTION AND BACKGROUND

The goal of this research effort was the establishment of methods for determining, and defining in advance of system application, the components of an incoming technology and measuring the effects of that technology on human resource parameters.

Achievement of the research goal has been attempted through the accomplishment of a series of related subtasks. The first of the defined subtasks was concerned with a review and critical analysis (Potter and Dieterly, 1974) of the recent literature in two areas: (1) forecasting and assessing technology and (2) techniques for predicting the impact of technology on human resource parameters. This review did not disclose the identification of an existing quantification procedure that was satisfactory.

In the search for a means of forecasting and assessing technology, the result was more positive. The recent literature supported the use of a normative approach to forecasting. Of the available normative techniques to forecasting, the conclusion was reached that a modification of the relevance tree approach (Cetron, 1969), known as a Design Option Decision Tree (DODT) (Askren and Korkan, 1971) would provide a means of graphically depicting the sequence of engineering decisions required and the design options available at each of the decision points in a system design process. Those decision points within a system which represent new technologies can be identified on the basis of expert judgment and assigned a position within the tree, as well

as graphically reflecting those decision points which depict proven hardware technology options.

INTRODUCTION TO HUMAN RESOURCE COMPONENT QUANTIFICATION EFFORTS

The selection of specific human resource components to be included in this study was guided by two primary concerns. First, an assessment of the ability to obtain judgmental data from field personnel in operational units. With this selection criterion, seven human resource components were chosen for use in a feasibility demonstration of the quantification procedure proposed.

(VIEWGRAPH--Figure 1)

The second area of concern was that the human resource components chosen for study would allow meaningful questions to be asked at each decision point in the DODT to which they were applied.

METHODS OF QUANTIFICATION

Of the methods of quantification available to the researcher, certain of the more fundamental ones can be quickly rejected for the purposes of this study. As example, the method of average error, the method of limits, and the method of frequencies, all fundamental psychophysical methods, are concerned with measuring or evaluating one stimulus. While they can be used in scaling, there is considerable inefficiency introduced in the number of observations required. These methods were therefore rejected for application to this study.

The one chosen -- the method of successive categories -- is a procedure of scaling which has found popularity and broad general usefulness in scaling problems as it does not require that the respondent be able to classify into an interval scale. It is particularly useful where difficulty is expected in obtaining stable judgments with other methods. A procedure subsumed under this classification is the method of summated ratings (Murphy and Likert, 1937; Edwards, 1957). Concern of this method is with the systematic variation of respondents to the stimuli presented. This variation is attributed to differences in the subjects. The immediate purpose of the method is to scale the respondents. This method was selected for an attempted mating with the DODT. The reasons for selecting the method were many. Foremost among them was the relative speed of administration of such a scaling procedure. Secondly, the simplicity of the instrument itself permitted standardization across the human resource components selected for collection of data. Thirdly, this technique typically shows higher reliability than do other methods of scaling (Edwards, 1957).

PROCEDURE

Rather than attempt to quantize the entire DAIS DODT which was developed, it was decided to utilize only selected design option decision points. This decision was dictated by the time constraints on the study, in addition to the preliminary feasibility demonstration nature of the task.

Eight decision points were selected for this study (handout Table 4). The rationale used in the selection process was to choose those decision points in the system which portrayed a technical area with which the subjects would be familiar by virtue of experience or training. Decision points were selected to reflect varying states of technology.

The Air Force has described the Digital Avionics Information System by classifying it into four functional areas referred to as core elements. These core elements are: processors, system programming, memory, and remote terminal units. In selecting the decision points and options for study, at least one decision point was selected in each core element of DAIS.

Selecting at least one decision point in each core element permitted a preliminary demonstration of the effects on one or more human resource parameters of the selection of various alternatives as one proceeds along a design path.

A set of seven questions was developed which would be applicable to all eight decision points identified for data collection. Use of the same set of questions for each of the decision points was intended to create a standardized response set in the technician.

A Likert-type scale was associated with each question and the technician was asked to position his response along the scale

in the form of a letter corresponding to the specific design option being considered. The results later were quantized by translation into interval scale points.

In addition to the questions involving maintenance/trouble-shooting at the decision points, background information was also collected on the technicians. This was done to allow weighting factors to be applied to the collected data.

Subjects were obtained from a maintenance squadron stationed at Myrtle Beach Air Force Base in South Carolina.

RESULTS

The subjects interviewed in this study, 32 in number, varied considerably with respect to age, background, and experience, but a majority of the subjects were enlisted men whose age was 25 or below and whose grade was E3 or E4.

Subject responses were solicited on 168 decision option/human resource component combinations. The number of responses obtained for each option ranged from 16 to 32, with the median number of responses at 31.

Descriptive statistics on the responses (number responding, mean response value, standard deviation, and range) are given in handout Tables 5-11.

Choices at four decision points were limited to two options each. Thus, the hypothesis of no difference is testable by means of a two-sample t-test. Based on the assumptions of equal means and equal but unknown variances, this test was employed. The accept-reject decision at the 0.05 level of significance for each HRC/decision point so tested is shown in this next viewgraph. This analysis revealed that 11 comparisons out of 28 would be

(VIEWGRAPH--Table 1)

interpreted as respresenting real differences in the human resource components involved. (The probability of such an occurrence is computed to be $P = 4.38 \times 10^{-8}$.)

The remaining decision points, four in number, all contained more than two options. For these decision points, an F-ratio was used as an overall test of the null hypothesis ($0_1 = 0_2 = \ldots = 0_k$) prior to probing the nature of the differences between the treatment means.

Shown on the next viewgraph is the accept-reject decision

(VIEWGRAPH--Table 2)

pattern for the DAIS decision points studied which contained more than two options. Fifteen of the 28 comparisons shown in this table would be accepted as representing real differences.

Correlation matrices were computed for each of the human resource components and design options against items of background information.

The results obtained from the correlational relationships between the design options and the items of background information surveyed were disappointing. On the basis of numbers of significant correlations obtained (77 out of 1176) this phase of the analysis must be regarded as producing negative results.

DISCUSSION

For the seven human resource components selected for feasibility study, the survey results indicate that four of the components, i.e., worker preference, skill level required, difficulty level of task, and time required to maintain or troubleshoot were significantly impacted in half or more of the decision point/option alternatives sampled. Further, the options available at three of the decision points studied appeared to have the heaviest impact on the human resource components under investigation. These decision points impacting on four or more of the human resource components were: the choice of single or multiple multiplex data buses for the system; the commonality of LRU processors, and the type of software structure.

In addition to the human factors considerations just covered, it is interesting to note the engineering implications of these choices as well. For example, consider the choices related to the memory type decision shown in this viewgraph. For the four

(VIEWGRAPH--Figure 2)

HRCs (worker preference, lower skill levels, least difficult task, and least maintenance time), there appeared to be a significant

HRC impact associated with both tape and core memory. This tends to indicate that there is a relationship between the degree of engineering sophistication and the level of demand on the human factors elements, i.e., as the system becomes more complex so does the impact on human factors. From an engineering standpoint, it may be more convenient to utilize some other memory such as disc or semiconductor because of considerations such as packaging and power requirements, whereas from a human factors standpoint, the logical choice would be core or tape. Here is an example of the frequent contradiction between the engineering choice and the human factors choice. To illustrate the use of the present technique in resolving this contradiction, on this next viewgraph, different paths are outlined through a segment of the DODT. The paths are held stable except for progress through three of the decision points studied.

(VIEWGRAPH--Figure 3)

It is possible to progress through the design tree with a goal of minimizing the impact on the human resource components (HRC) associated with each point. For example, following this philosophy for three human resource components (skill levels required, difficulty of maintenance or troubleshooting, and time required to maintain or troubleshoot) would result in following the path coded "1" through the tree. The total HRC Impact Score for this path is 33.3. If the worst case had been observed at each decision point for each of the 3 HRCs then the attained score would be 90. Next consider the path marked "2". This path depicts a system where at all decision points the options

representing advanced technology are selected. The HRC Impact Score in this instance is 53.2. The separate design philosophies through this segment of the DAIS-DODT result in scores of 33.3 and 53.2. Both of these compare against the worst case score of 90 as well as against each other.

Thus, this DODT segment serves as an illustration of the utility of the developed procedure to system designers and to personnel planners in the identification of human resource component trade studies which are required for certain desired design outcomes. The advantage of the proposed procedure lies in the fact that it would permit detailed identification of human resource component trade studies and assign values to human resource components far in advance of hardware design decisions. Thus, the trade study results could serve as input data for influencing a hardware design decision.

CONCLUSION

In summary, the results obtained from application of this methodology were felt to support its feasibility and appear to encourage continued refinement of the procedure leading to application in system conceptual design efforts.

REFERENCES

Askren, W.B. and Korkan, K.D., Design Option Decision Trees: A Method for Relating Human Resources Data to Design Parameters, AFHRL TR-71-52, December 1971.

Cetron, M.J., Technological Forecasting: A Practical Approach, New York: Gordon and Breach, 1969.

Edwards, A.L., Techniques of Attitude Scale Construction, New York: Appleton-Century-Crofts, 1957.

Murphy, G. and Likert, R., Public Opinion and the Individual, New York: Harper, 1937.

Potter, N.R. and Dieterly, D.L., Methods for Predicting and Assessing the Impact of Technology on Human Resource Parameters: Report of the Literature, AFHRL TR-74-71, August 1974 (Published in JSAS Catalog of Selected Documents in Psychology, Winter Issue, 1974).

TABLES AND FIGURES TO ACCOMPANY

THE PAPER

"QUANTIFICATION OF THE IMPACT OF TECHNOLOGICAL CHANGES ON HUMAN RESOURCES"

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- Worker preference
- Desirability of written procedural manuals
- Level of skill required
- Difficulty level of task
- Extent of training required
- Environmental effects on maintenance
- Amount of time required for maintenance

Figure 1. Human Resource Components Selected for Data Collection, DAIS-DODT Survey, August 1974.

TABLE 1. ACCEPT-REJECT DECISION FOR THE NULL HYPOTHESIS† RESULTING FROM COMPUTATION OF TWO-SAMPLE t-TESTS FOR THE HUMAN RESOURCE COMPONENTS AND DECISION POINTS SHOWN TOGETHER WITH THE PER CENT OF REJECTION OF THE NULL HYPOTHESIS FOR EACH HUMAN RESOURCE COMPONENT, DAIS-DODT SURVEY, AUGUST 1974.

Human Resource Component	Decision Points 1 (A,B)	3 (A,B)	7 (A,B)	8 (A,B)	Per Cent Rejection of Null Hypothesis
1	R§	A	R	R	75
2	R	A	A	A	25
3	R	A	A	A	25
4	R	R	R	A	75
5	A	A	A	R	25
6	A	A	A	A	0
7	R	R	A	A	50

†Decision made at the 0.05 level of significance.

§R = Reject the null hypothesis; A = Accept the null hypothesis.

TABLE 2. ACCEPT-REJECT DECISION FOR THE NULL HYPOTHESIS† RESULTING FROM ANALYSIS OF VARIANCE OF THE HUMAN RESOURCE COMPONENTS AND DECISION POINTS SHOWN TOGETHER WITH THE PER CENT OF REJECTION OF THE NULL HYPOTHESIS FOR EACH HUMAN RESOURCE COMPONENT, DAIS-DODT SURVEY, AUGUST 1974

Human Resource Component	Decision Points 2 (A,B,C,D)	4 (A,B,C)	5 (A,B,C)	6 (A,B,C,D,E,F)	Per Cent Rejection of Null Hypothesis
1	R§	R	R	R	100
2	A	A	A	A	0
3	A	R	R	R	75
4	A	R	R	R	75
5	R	R	A	A	50
6	A	R	A	A	25
7	A	R	R	A	50

†Decision made at 0.05 level of significance.

§R = Reject the null hypothesis; A = Accept the null hypothesis.

TABLE 3. COMPLETE ACCEPT-REJECT MATRIX FOR THE SEVEN HUMAN RESOURCE COMPONENTS AND THE EIGHT DECISION POINTS SURVEYED IN THE DAIS-DODT SURVEY, AUGUST 1974.

HRC	Decision Points†								Per Cent Rejection of Null Hypothesis
	1	2	3	4	5	6	7	8	
1	R	R	A	R	R	R	R	R	88
2	R	A	A	A	A	A	A	A	12
3	R	A	A	R	R	R	A	A	50
4	R	A	R	R	R	R	R	A	75
5	A	R	A	R	A	A	A	R	38
6	A	A	A	R	A	A	A	A	12
7	R	A	R	R	A	R	A	A	50

†Decision Points 1, 3, 7 and 8 compared by means of t-tests; decision points 2, 4, 5, and 6 by F-ratios.

Options To Be Considered For The Dais Decision Point - - Memory Type

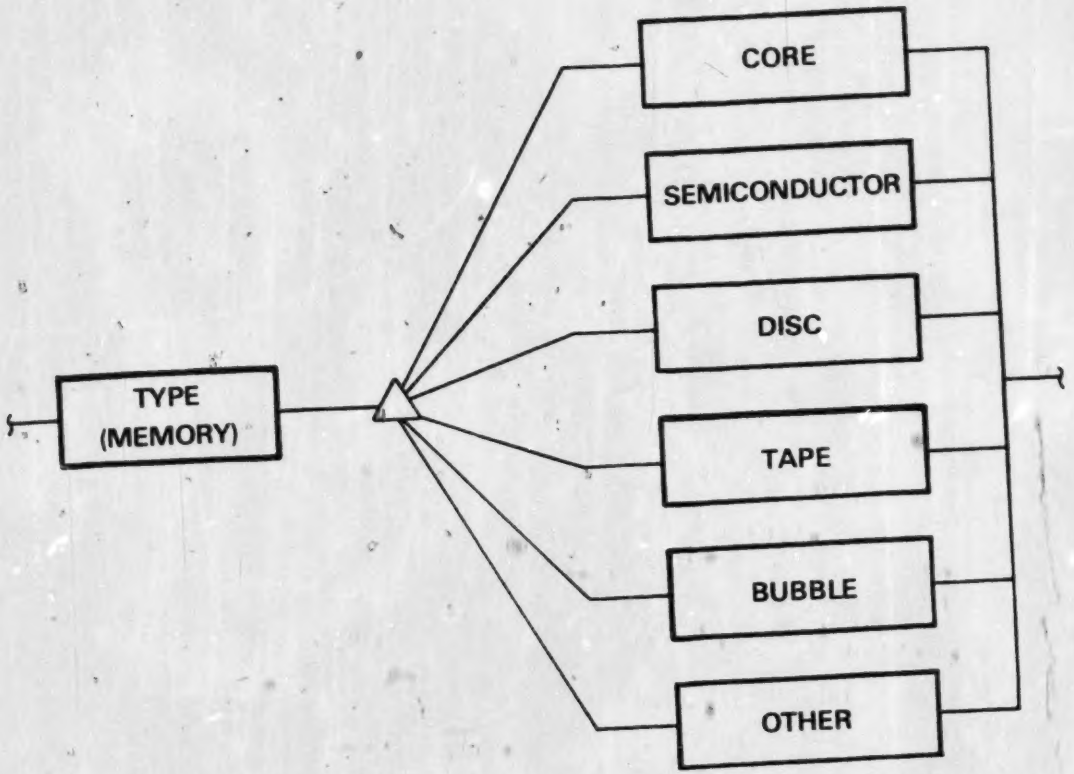

Figure 2. Various Types of Memories to be Considered in Digital Avionics Information Systems.

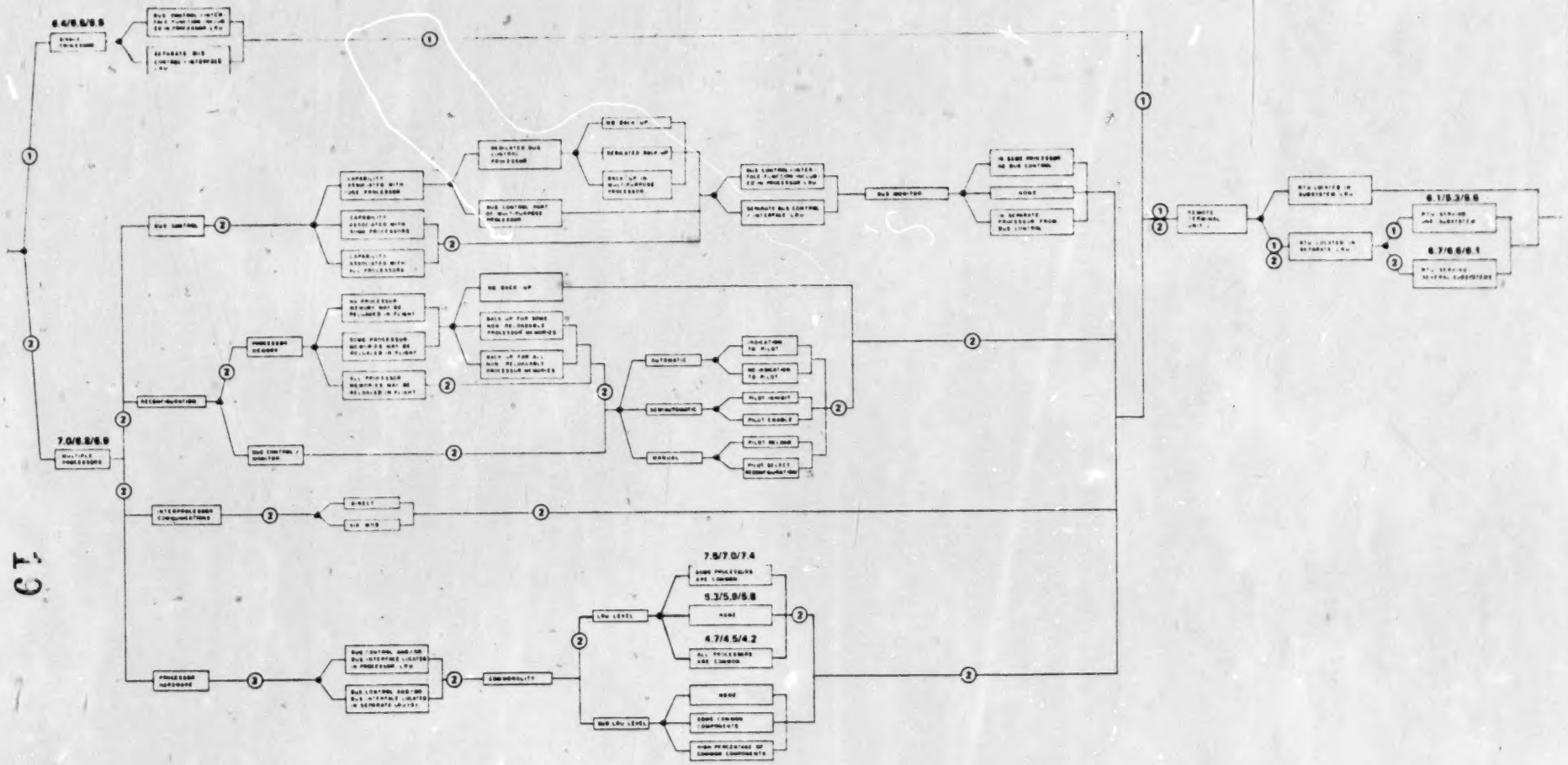

Figure 3. Segment of the Design Option Decision Tree Used Demonstra
Decision Trades and Utility of Format, DAIS-DODT Survey,
August, 1974.

TABLE 4. LISTING OF DESIGN OPTIONS AND ASSOCIATED CODE DESIGNATORS USED IN MAINTENANCE SURVEY CONDUCTED AT MYRTLE BEACH AFB, S.C., AUGUST 1974.

CODE DESIGNATION	IDENTIFICATION
1A	Single Multiplex Data Bus System
1B	Multiple Mutliplex Data Bus System
2A	Shielded-Twisted Line Pair Bus
2B	Coax Bus
2C	Electro-optical Bus
2D	Other types of Bus
3A	Single Data Processor
3B	Multiple Data Processor
4A	No common processors at LRU level
4B	Some common processors at LRU level
4C	All common processors at LRU level
5A	Modular Structure Software
5B	Mixed Structure Software
5C	Tightly Packed Structure Software
6A	Core Memory
6B	Semiconductor Memory
6C	Disc Memory
6D	Tape Memory
6E	Bubble Memory
6F	Other types of Memory
7A	Remote Terminal Unit Serving One System
7B	Remote Terminal Unit Serving Several Systems
8A	Custom Designed Signal Modification Hardware
8B	Modular Design Signal Modification Hardware

TABLE 5. WORKER PREFERENCE (HRC-1) FOR DESIGN OPTIONS WITHIN EACH DECISION POINT SURVEYED, SAMPLE OF 32 TECHNICIANS, MYRTLE BEACH AFB, S.C., AUGUST 1974.

Decision Point and Option	Number Responding	Mean Response	Standard Deviation	Range
1A	31	6.4	2.61	10
1B	32	4.8	2.76	10
2A	30	4.8	2.87	10
2B	30	2.1	2.24	8
2C	29	6.4	2.36	9
2D	20	6.1	1.90	6
3A	32	6.1	2.72	10
3B	32	5.2	2.66	10
4A	30	3.2	3.13	10
4B	32	4.8	1.54	6
4C	32	7.5	2.25	8
5A	32	6.5	2.98	10
5B	32	5.2	1.90	9
5C	32	4.1	2.68	10
6A	29	6.7	2.44	10
6B	29	5.4	2.20	9
6C	29	4.8	3.30	10
6D	28	4.8	2.84	10
6E	27	4.4	2.79	10
6F	19	5.4	1.95	6
7A	32	6.5	2.75	10
7B	32	4.8	2.45	10
8A	31	5.4	2.04	10
8B	31	6.8	1.86	6

TABLE 6. DESIRABILITY OF WRITTEN PROCEDURAL MANUALS (HRC-2) FOR DESIGN OPTIONS WITHIN EACH DECISION POINT SURVEYED, SAMPLE OF 32 TECHNICIANS, MYRTLE BEACH AFB, S.C., AUGUST 1974.

Decision Point and Option	Number Responding	Mean Response	Standard Deviation	Range
1A	31	8.2	1.67	5
1B	32	9.0	1.12	5
2A	30	7.6	2.15	6
2B	30	7.9	1.75	6
2C	29	8.5	1.63	6
2D	22	8.2	2.10	7
3A	32	8.3	1.62	5
3B	32	8.9	1.27	5
4A	31	8.1	1.74	5
4B	32	8.1	1.44	5
4C	31	8.2	1.59	5
5A	31	8.3	1.50	5
5B	31	8.5	1.56	5
5C	31	8.5	1.64	5
6A	29	8.4	1.50	5
6B	29	8.3	1.62	5
6C	29	8.8	1.44	5
6D	28	8.2	1.65	5
6E	26	8.6	1.47	5
6F	20	8.2	1.81	5
7A	32	8.0	1.75	8
7B	32	8.5	1.68	8
8A	31	8.7	1.23	5
8B	31	8.1	1.55	5

TABLE 7. LEVEL OF SKILL REQUIRED (HRC-3) FOR DESIGN OPTIONS WITHIN EACH DECISION POINT SURVEYED, SAMPLE OF 32 TECHNICIANS, MYRTLE BEACH AFB, S.C., AUGUST 1974.

Decision Point and Option	Number Responding	Mean Response	Standard Deviation	Range
1A	32	5.8	2.04	8
1B	32	7.4	2.09	8
2A	31	5.0	2.57	9
2B	31	5.8	2.55	9
2C	30	6.7	2.18	8
2D	20	6.0	2.06	9
3A	32	6.4	1.68	6
3B	32	7.0	2.36	9
4A	30	7.5	2.32	10
4B	32	6.3	1.57	6
4C	32	4.7	3.07	10
5A	32	5.9	2.65	10
5B	32	6.4	1.85	10
5C	32	7.5	2.15	9
6A	29	5.7	2.66	10
6B	28	6.1	2.33	9
6C	28	5.8	2.20	9
6D	26	4.7	2.60	10
6E	25	7.4	1.96	5
6F	17	6.5	2.17	9
7A	32	6.1	2.32	9
7B	32	6.7	2.31	9
8A	31	6.7	2.50	10
8B	31	6.2	1.70	7

TABLE 8. DIFFICULTY LEVEL OF TASK (HRC-4) FOR DESIGN OPTIONS WITHIN EACH DECISION POINT SURVEYED, SAMPLE OF 32 TECHNICIANS, MYRTLE BEACH AFB, S.C., AUGUST 1974.

Decision Point and Option	Number Responding	Mean Response	Standard Deviation	Range
1A	31	4.4	2.21	8
1B	31	6.6	2.07	8
2A	31	5.4	2.72	10
2B	31	5.9	2.30	9
2C	30	6.7	2.37	8
2D	19	6.2	2.23	9
3A	32	5.6	2.42	10
3B	32	6.8	2.08	8
4A	30	7.0	2.55	10
4B	32	6.0	1.38	6
4C	32	4.5	2.82	10
5A	32	5.6	2.68	10
5B	32	6.3	1.44	5
5C	32	7.2	2.48	10
6A	29	5.2	2.89	10
6B	28	6.4	2.41	9
6C	28	5.5	2.62	10
6D	27	5.1	2.64	10
6E	25	7.5	1.75	5
6F	17	6.7	2.84	10
7A	32	5.3	2.31	9
7B	32	6.6	2.32	9
8A	31	6.7	2.21	9
8B	31	5.7	2.05	9

TABLE 9. EXTENT OF TRAINING REQUIRED (HRC-5) FOR DESIGN OPTIONS WITHIN EACH DECISION POINT SURVEYED, SAMPLE OF 32 TECHNICIANS, MYRTLE BEACH AFB, S.C., AUGUST 1974.

Decision Point and Option	Number Responding	Mean Response	Standard Deviation	Range
1A	32	6.2	2.06	8
1B	32	7.0	1.99	8
2A	30	4.8	2.91	10
2B	30	5.3	2.55	9
2C	28	6.9	1.67	6
2D	18	6.4	1.86	7
3A	32	5.9	2.54	10
3B	32	6.9	2.04	7
4A	30	7.5	2.66	10
4B	32	6.0	1.45	6
4C	32	4.1	2.66	10
5A	32	6.0	2.04	10
5B	32	6.2	1.64	7
5C	32	6.8	2.67	10
6A	29	6.3	2.48	10
6B	28	7.0	2.44	9
6C	28	5.9	2.68	9
6D	27	5.5	2.67	10
6E	25	7.5	2.10	7
6F	17	6.8	3.09	10
7A	32	5.9	1.80	8
7B	32	6.5	2.11	9
8A	31	7.1	1.68	5
8B	31	5.8	1.96	9

TABLE I0. ENVIRONMENTAL EFFECTS ON MAINTENANCE AND TROUBLESHOOTING (HRC-6) FOR DESIGN OPTIONS WITHIN EACH DECISION POINT SURVEYED, SAMPLE OF 32 TECHNICIANS, MYRTLE BEACH AFB, S.C., AUGUST 1974.

Decision Point and Option	Number Responding	Mean Response	Standard Deviation	Range
1A	32	6.3	2.06	9
1B	32	7.3	2.08	7
2A	30	5.9	2.92	10
2B	30	6.5	2.31	9
2C	28	6.4	2.19	8
2D	18	6.4	2.24	10
3A	32	6.4	2.69	10
3B	32	7.5	2.22	8
4A	30	7.6	2.52	10
4B	32	6.4	1.58	6
4C	32	5.0	2.63	10
5A	32	6.3	2.28	10
5B	32	6.8	1.37	6
5C	32	7.3	2.70	10
6A	29	6.7	2.47	9
6B	28	7.2	2.24	9
6C	28	6.8	2.26	8
6D	27	6.7	2.35	9
6E	25	7.5	2.10	7
6F	16	7.2	3.09	10
7A	32	6.2	2.54	9
7B	32	7.0	2.37	9
8A	31	6.6	2.22	8
8B	31	6.3	2.23	8

TABLE 11. TIME REQUIRED FOR MAINTENANCE OR TROUBLESHOOTING (MRC-7) FOR DESIGN OPTIONS WITHIN EACH DECISION POINT SURVEYED, SAMPLE OF 32 TECHNICIANS, MYRTLE BEACH AFB, S.C., AUGUST 1974.

Decision Point and Option	Number Responding	Mean Response	Standard Deviation	Range
1A	32	4.9	1.95	8
1B	32	6.8	2.09	9
2A	30	5.4	2.82	10
2B	30	5.8	2.63	9
2C	28	5.7	2.03	9
2D	18	5.8	2.19	10
3A	32	5.5	2.44	10
3B	32	6.9	2.09	9
4A	30	7.4	2.86	10
4B	32	5.8	1.58	7
4C	32	4.2	2.64	10
5A	32	5.7	2.54	10
5B	32	6.6	1.58	6
5C	32	7.0	2.75	10
6A	29	5.6	2.31	10
6B	28	6.4	2.42	9
6C	28	5.5	2.34	9
6D	27	5.0	2.62	10
6E	25	7.4	1.98	7
6F	16	6.8	3.19	10
7A	32	5.5	2.63	9
7B	32	6.1	2.42	10
8A	31	6.6	2.12	9
8B	31	5.6	2.34	9